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The basin approach to the anthropogenic impact assessment in oil-producing region

Yermolaev O., Usmanov B.
Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia

Abstract

© SGEM2014 All Rights Reserved. Basin approach used to estimate impact of oil and gas industry on the environment and to develop solutions for natural resources optimization on the study territory. The main objective was to find effective methods of analyzing spatial and temporal patterns of geosystems functioning under strong anthropogenic pressure. The complexity of natural systems and the need to integrate large number of factors required the use of modern methods of geoinformatics, information technology, mathematical and cartographic modeling. 713 watersheds of 2-3 orders allocated in the region of JSC "Tatneft" for the purpose of spatial analysis. Weighted scores method with extensive involvement of GIS spatial analysis used for an integrated anthropogenic disturbance assessment within the elementary basins. As a result, "Map of cumulative anthropogenic impact" and "Integral environmental assessment map" were built. "Map of cumulative anthropogenic impact" allows through the selected parameters to identify the impacts caused by agricultural activity and "Integral environmental assessment map" – oil and gas industry impact on the environment. A technique for quantifying of different sectors of the economy contribution to human impact on the certain components of the landscape realized by the example of forest vegetation. Methods of forest separating fragmentation by road network (transport) and linear facilities of the oil industry study allowed evaluating of their contribution to overall level of human impact.

Keywords

Anthropogenic impact, Basin approach, Geographic information systems, Integrated assessment, Spatial analysis